

EXERCISES

Nimi: _____

Physics: Oscillation

In these tasks, you will need the following formulae:

$$\text{time of oscillation} = \frac{s}{\#}$$

$$\text{frequency} = \frac{\#}{s}$$

1. Match the statement with the correct quantity.

"How many oscillations are measured in one second?"

"How many seconds does one oscillation take?"

frequency

time of oscillation

7,987 s

15 Hz

0,17 mHz

165,4 ks

2. Fill the table with the correct values, **units included**.

10 oscillations	time of oscillation	frequency
16,7 s		
	7,0 s	
		0,25 Hz
0,2 s		
	0,2 s	
		0,2 Hz

3. The maximal pulse frequency of a human heart decreases steadily with age. The maximal value in one minute is, on average,

$$220 - \text{age}.$$

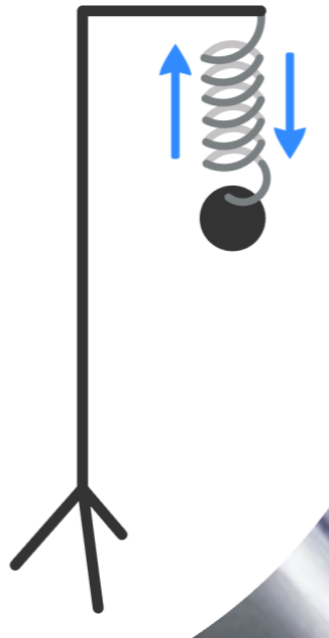
a. Find the maximal pulse frequency of a 40-year-old heart.

b. Find the corresponding frequency.

c. How many pulses does such a heart beat in one second?

4. Scientist the scientist measured the time of oscillation of a weight on a spring, subject to different variables.

a. Name the pieces (5 kpl) of equipment in the apparatus below. You will find the names in the pendulum handout.



- a. In the first measurement, Scienta measured times of oscillation with a 100 g weight, repeating the experiment 3 times. Find the times of oscillation.

time for 10 oscillations	time of oscillation
12,5 s	
13,3 s	
12,9 s	

- b. Based on the base test, Scienta tried to measure the effect that adding weights has. Fill in the table with times of oscillation and deduce whether or not the weights have an effect.

mass of weights	time for 10 oscillations	time of oscillation
100 g	12,5 s	
150 g	15,9 s	
200 g	18,4 s	

5. While cruising normally, the rotations in a car motor are usually around 1500 rpm. Find the rotation frequency in this situation.

6. The Earth rotates around its axis every 24 hours. Find the rotation frequency in this situation.

7. The clock frequency of a computer processor chip is 3,8 GHz, or 3 800 000 000 Hz. Find the time of oscillation in this situation.

8. Draw how you would measure the wavelength of the waves in the figures below. Mark down your answer next to the line segment.

